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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/724,606

12/02/2003

Shigeru Sakamoto

65933-057

8763

7590 02/27/2007  
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EXAMINER

MERCADO, JULIAN A

ART UNIT

PAPER NUMBER

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/27/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/724,606

Applicant(s)

SAKAMOTO, SHIGERU

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,4,6,7,9-11,13,14,16,17,19 and 21-26 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

- 6) ☒ Claim(s) 1,3,4,6,7,9-11,13,14,16,17,19 and 21-26 is/are rejected.

- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Remarks***

This Office action is responsive to applicant's amendment filed on December 1, 2006.

Claims 1, 3, 4, 6, 7, 9-11, 13, 14, 16, 17, 19 and 21-26 are pending.

This Office action sets forth a new ground of rejection and is therefore made NON-FINAL.

***Claim Rejections - 35 USC § 102***

The rejection of claims 1, 11 and 27 under 35 U.S.C. 102(b) based on Makita et al. (U.S. Pat. 3,991,169) has been withdrawn.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3, 4, 6, 7, 9-11, 13, 14, 16, 17, 19 and 21-26 are rejected under 35 U.S.C. 103(a) as obvious over McCullough (U.S. Pat. 5,518,836) in view of either Taniguchi et al. (U.S. Pat. 6,083,638) or applicant's admitted prior art, Taniguchi et al. (JP 10-289723, hereinafter "AAPA").

The examiner notes the present amendment to claim 1 now requiring the limitations of claim 2 and claim 20 (each now canceled). To this extent, the rejection based on McCullough as

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set forth under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) is maintained for the reasons of record and for the additional and supplemental reasons to follow.

Applicant's arguments filed with the present amendment have been fully considered and are persuasive in-part. Regarding the gas diffusion layer being processed with a fluoro-resin to attain a water-repellency as presently claimed, applicant has urged the examiner to give this feature a structural interpretation. The examiner thus concedes that while specification limitations are not read into the claim, the processing with fluoro-resin is understood to impart a structural feature insofar as page 4 line 22 et seq. of the specification discloses that the fluoro-resin "may be coated on a surface or an interior portion of the gas diffusion layer." However, while McCullough does not explicitly teach the gas diffusion layer processed with a fluoro-resin, Taniguchi et al. teaches a fluoro-resin such as PTFE for the porous current collectors of a fuel cell, which similarly serve as gas diffusion layers. See col. 6 line 6 et seq. and line 46 et seq. The skilled artisan would find obvious to modify McCullough's invention by processing the gas diffusion layer with a fluoro-resin in order to impart a desired hydrophobic property and reinforce its strength mechanically. (ib.)

Additionally, the examiner notes AIPA on page 2 of the specification stating that "techniques of employing a porous substrate such as a carbon paper or giving water-repellency to the gas diffusion layer with a fluoro-resin have been disclosed..." Thus, for reasons such as giving water-repellency, the skilled artisan would find obvious to modify McCullough's invention by processing the gas diffusion layer with a fluoro-resin.

As to applicant's separate arguments for patentability of claims 21-24, these arguments have been fully considered. However, while McCullough does not explicitly teach carbon

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particles applied to the gas diffusion layer, Taniguchi et al. teaches carbon powder, *inter alia*, applied to the holes of the current collector/gas diffusion layer. See col. 4 line 65 et seq. and Figure 10. The skilled artisan would find obvious to modify McCullough's invention by applying carbon particles to the gas diffusion layer to impart a hydrophilic property as compared to the fluororesin. (ib.)

The rejection of claims 7-9 premised on the instant ratio of a longest distance to a shortest distance from center of not less than 1.2 being an optimizable parameter for result-effective variable is withdrawn. It is asserted, however, that McCullough teaches the following:

The term "effective cross-sectional diameter" as it applies to a fiber having a generally circular cross-section, is the distance from one point along the outer surface of the fiber through the center of the fiber to an opposite point on its outer surface. In the case of a fiber having a generally non-circular cross-section, the effective cross-sectional diameter is the distance extending across a generally circular region where the core material of the fiber is solid and uninterrupted (see reference no.32 in FIG. 2A). By the term "generally circular cross-section of a fiber", it is also meant that the diameter of the generally circular in cross-section fiber can vary in its circularity due to the fact that during extrusion of the fiber the hot melt extrudate has a tendency to flow until it is sufficiently cooled to set. Thus, the cross-section of the fiber is not generally in the shape of a perfect circle but contains some slight variations in its circularity. The same applies to the non-circular fibers of the invention. For example, the hot polymer that is extruded through a tri-lobal die will continue to flow until the polymer is cooled sufficiently thus forming a tri-lobal fiber in which the individual lobes are not perfectly symmetrical.

Thus, in view of McCullough's specific teaching that the cross-section of the carbon fiber can vary in its circularity, it would naturally flow for a ratio of a longest distance to a shortest distance to be not less than 1.2, *inherently*, absent of a showing by applicant that the claimed invention distinguishes over the reference. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990)

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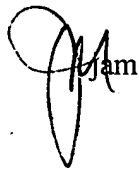
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

am

  
PATRICK JOSEPH RYAN  
SUPERVISORY EXAMINER